

*Endamœba blattæ.*

*Eine Art Proteus*, Seibold, Beitr. z. Naturges. d. wirb. Thiere, 1839, *vide* Stein.

*Amöbenform*, Stein, Organismus d. Infusionsthier, 1867, ii. p. 345.

*Amœba Blattæ*, Bütschli, Zeitsch. f. wiss. Zoologie, 1878, xxx. p. 273, Taf. xv. fig. 26.

Initial form globular, passing into spheroidal, oval, or variously lobate forms, mostly clavate, and moving with the broader pole in advance. Protoplasm finely granular, and when in motion more or less distinctly striate. Nucleus spherical, granular, with a large nucleolus. Distinct food particles commonly few or none. Size of globular forms 0.054 millim. to 0.075 in diameter; elongated forms 0.075 by 0.06 to 0.15 by 0.09 millim. Parasitic in the large intestine of *Blatta orientalis*.

The *Endamœba blattæ* affords a good example of a primitive active nucleated organic corpuscle, or a so-called organic cell without a cell-wall. In the encysted condition it would be a complete nucleated organic cell. *Endamœba* may be recommended as a convenient illustration of a primitive form of the organic cell, on account of its comparatively ready accessibility.—*Proc. Acad. Nat. Sci. Philad.*, October 7, 1879.

*On the Habits and Parthenogenesis of the Halicti.*

By M. J. H. FABRES.

Two species have chiefly furnished the materials for the preparation of this paper, namely *Halictus lineolatus*, Lep., and *H. sexcinctus*, Latr. The investigation of the former was made under the most favourable conditions; every day, at whatever moment he chose, and from one end of the year to the other, the observer had under his eyes the object of his inquiries in its natural state of being. The place of observation was in front of his door, in the open country, in the midst of meadows. It was among the osier-beds of the alluvial deposits of the Aygues, a torrent to the north of Orange, that the second species (*H. sexcinctus*) was observed, in a colony sufficiently populous to lend itself to detailed observations. Followed up for a whole year, the study of these Hymenoptera has furnished the following results.

Among the *Halicti* there is no society in the entomological sense of the word: the family is not common; and the cares of all have not in view the interests of all. Each mother is only preoccupied with her own oviposition, and constructs cells and collects pollen only for her own larvæ, without interfering at all with the rearing of the larvæ of others; but there is nevertheless cooperation between them for general work, of which several may take advantage without hampering each other. This common work is the gallery, which, ramifying in the depths of the soil, gives access to various groups of cells, each of which groups is the property of a single *Halictus*.

A single entrance-gate and a single passage thus correspond to several distinct domiciles.

It is especially at night that these digging labours for the excavation of the cells and the boring of new galleries are performed. A cone of fresh earth raised on the threshold of the orifice of the passage bears witness every morning to the nocturnal activity, and by its size proves that several Hymenoptera have participated in the work.

The cells of the *Halicti* consist of oval excavations, narrowed into a neck at the upper part. Their walls are varnished with a water-proof coating, which adds to the delicate polish of the chamber and protects the interior from the invasion of damp. This varnish is of the same nature as the goldbeater's-skin-like substance with which the *Colletes* line their galleries and construct their little honey-bags. Every thing tends to prove that this product of the two types of Hymenoptera is of salivary origin, and may be compared to the mucosity which certain birds, such as the swift and the salangane, introduce into the construction of their nests.

For the *Halicti* September is solely the month of amours. Then the males, whose number exceeds that of the females, dance incessantly over the burrows and make their way into the passages. The females remain in retirement in their cells or in the galleries, and the copulation takes place underground. When the first chills of November arrive all the males have disappeared; and the females, which are then fertilized, pass the winter enclosed in their cells.

Towards the month of May the females, fertilized in the autumn, issue from their burrows and work at the nest in the absence of all males, whose assistance, however, is none the less real because it has preceded the oviposition by six months.

In July a second generation is produced, without the presence of any males; but this time the want of cooperation of one of the sexes is no longer an appearance, but a reality placed beyond doubt by the continuity of the observations.

Two months later males and females are produced from this generation of a single sex. Fecundation takes place underground; the males perish; the females hibernate; and the same order of things recommences.

Thus the *Halicti* have two generations yearly:—one in the spring, sexual, proceeding from mothers which, having been fertilized in the autumn, have passed the winter in their cells; the other, æstival, due to parthenogenesis. From the concurrence of the two sexes females alone are produced; from parthenogenesis originate both males and females.

From this it seems probable that other insects with several ovipositions in the year may possess the double mode of reproduction of the *Halicti*; but, with the exception of the Aphides, the parthenogenesis of which has so long been known, what are these insects? and if there are such, do they confirm the suspicions to which the *Halicti* give rise? This the author proposes to investigate.

*Halictus sexcinctus* has *Myodites subdipterus* as a parasite. The larva of this curious fly-like beetle devours the larva of the Hymenopteron when the latter has finished its provision of honey. The author does not yet know how the parasitic worm-like creature, which is incapable of progression, is introduced into the cell of the *Halictus*. Perhaps there may be here an initial transfiguration, and habits having some analogy to those of the Meloïdes.—*Comptes Rendus*, Dec. 22, 1879, p. 1079.

*On the Locomotion of Insects and Arachnida.*

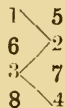
By M. G. CARLET.

The mode of locomotion of insects and Arachnida is much more regular than is usually supposed. The only rule laid down by authors is that the two legs of the same pair never move simultaneously. By examining insects the movements of which are slow and the legs equidistant, such as *Oryctes nasicornis* and *Timarcha tenebricosa*, we see that the limbs move as indicated in the following table, in which the legs are arranged in their natural position, and the numbers indicate the order in which they are raised :—



Whilst the legs 1, 2, 3 are raised almost simultaneously, the legs 4, 5, 6 remain in support, to be raised in their turn when the former have come to rest. In other words, the insect rests upon a triangle of sustentation formed by the two extreme feet of the same side and the middle foot of the other side, while it moves forward the other three feet. I have ascertained that this mode of locomotion is equally characteristic of the other orders of insects.

*Arachnida*.—I have been able to follow very clearly the order of movement of the legs in the female of *Epeira diadema*. It is almost impossible to catch this order in male spiders, in consequence of the rapidity of their progression. In the females the voluminous abdomen forms a burden which retards movement and enables the following table to be traced :—



Here the polygon of sustentation is a quadrangle formed on the one side by the feet of even numbers, and on the other by those of odd numbers.—*Comptes Rendus*, December 29, 1879, p. 1124.